

CLAIMS

What is claimed is:

1. A method of fabricating a board from milled straw comprising the steps of:
blending the milled straw with a binder to form a mixture;
forming the mixture into a mat with sufficient size to achieve a predetermined
board thickness and density; and
pressing and curing the mat into the board.
2. The method as recited in claim 1, wherein the milled straw is rice straw.
3. The method as recited in claim 1, further comprising the step of removing a
portion of fines from the milled straw prior to blending.
4. The method as recited in claim 1, further comprising the step of milling straw.
5. The method as recited in claim 1, wherein the milled straw has an average
longitudinal length of approximately 0.125 inches to 1.5 inches.
6. The method as recited in claim 1, further comprising the step of controlling
the moisture content of the milled straw from approximately 1% to 12% of the milled straw
weight.

1 7. The method as recited in claim 6, wherein the moisture content is controlled
2 with an oven.

1 8. The method as recited in claim 1, further comprising the step of blending the
2 mixture with a fire retardant material comprising one or more of: organic phosphates,
3 borates, sodium silicates, aluminum trihydrates, or rice hulls.

1 9. The method as recited in claim 8, wherein the binder and the fire retardant
2 material are added at a rate of approximately 2% to 20% of the milled straw weight on a
3 dried basis.

1 10. The method as recited in claim 8, wherein the milled straw weight is
2 determined by a scale with a feedback control mechanism to regulate the rate of the binder
3 and the fire retardant material.

1 11. The method as recited in claim 1, wherein the blending is performed in a high-
2 speed blender.

1 12. The method as recited in claim 1, wherein the board is attached to one or more
2 door skins.

1 13. A fire resistant board comprising:
2 milled rice straw;
3 a resin binder; and
4 a fire retardant material comprising one or more of an organic phosphate, a
5 borate, sodium silicate, aluminum trihydrate, or rice hulls.

1 14. The board as recited in claim 12, wherein the milled rice straw has an average
2 longitudinal length of about 0.125 inches to about 1.5 inches.

1 15. The board as recited in claim 12, wherein the resin binder is an isocyanate
2 resin.

1 16. The board as recited in claim 12, wherein the resin binder comprises between
2 about 2% and about 10% of the weight on an oven dry basis.

1 17. The board as recited in claim 12, wherein the fire retardant material comprises
2 between about 2% and about 20% of the weight on an oven dry basis.

1 18. The board as recited in claim 12, wherein the board is attached to one or more
2 door skins.

1 19. The board as recited in claim 12, wherein the board is attached to a doorframe.

1 20. A fire resistant door comprising:
2 an inner door core comprising milled rice straw fiber in a cured resin matrix;
3 and
4 a doorframe comprising a fire-resistant material.

1 21. The door as recited in claim 20, wherein the milled straw fiber has an average
2 longitudinal length of approximately 0.125 inches to 1.5 inches.

1 22. The door as recited in claim 20, wherein the door core further comprises a fire
2 retardant material comprising one or more of: an organic phosphate, a borate, sodium silicate,
3 aluminum trihydrate, or rice hulls.

1 23. The door as recited in claim 20, further comprising one or more door skins.